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MINOR STUDIES FROM THE PSYCHOLOGICAL LABORATORY OF CLARK UNIVERSITY

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XXII. CHILDREN'S CAPACITY FOR ABSTRACT THOUGHT AS SHOWN BY THEIR USE OF LANGUAGE IN THE DEFINITION OF ABSTRACT TERMS

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The close dependence of thought in all its higher forms upon language has been universally recognized. To think in any but the most concrete way means almost without exception to think in words. Without abstract terms generalization can reach but a low level; and at its higher levels the word (or symbol standing for it) is the sole means of holding and using the general idea.<sup>1</sup>

But this is not all; in not a few cases the learning of the abstract term is an important step towards becoming acquainted with the abstract idea for which it stands. The word assists in sharpening attention and gives notice that an idea corresponding to it exists and may be found. How much of human capacity in dealing with abstractions depends on the fact that children are born into a speaking environment would be hard to estimate, but the influence is certainly not small.

Facility in the use of language is in some degree, therefore, an index, though of course not the only one, of mental development. The age at which children learn to speak and the number of words which they can understand and use at various ages have long been a matter of interest both to parents and to students of the early stages of child life, and several laboratory tests turning exclusively on knowledge of words or skill in handling them have been proposed for determining mental condition at different ages.

A step beyond the ordinary comprehension and correct use of abstract terms is required, however, for the exact definition of them. No one has reached the highest level of skill in abstract thought until he is able to state the precise scope and limitations of the terms that he uses. The method and the success of attempted definitions may thus serve as still another measure of attainment in the power in question.<sup>2</sup>

In view of all this, a study of the ability of children of different ages in the defining of abstract terms might be expected to give useful information with reference to their advancement in the power of abstract thought and no doubt would do so, if carried out under favorable circumstances and with due regard to the correlation of

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<sup>1</sup> Ribot: *Evolution of General Ideas*.

<sup>2</sup> Definition, from a psychological point of view, is an effort to call up in the mind of another an adequate conception of an idea in the mind of the speaker. Many means may be employed for thus "conveying the idea." The child or the practical man often does so by giving a sample—by citing an instance or giving an example or even by pointing out, or showing, what is meant. The logician defines by genus and difference. Between these two extremes there is a considerable range of procedure, some forms of which appear in the data to be considered.

power of this sort with that in other directions. The present study goes but a short step in that direction, however, for the material, while collected under the supervision of a university professor in the schools of a western city and kindly placed at the disposal of the writer by him, is adequate only for a study of the relation of age and sex to defining ability in a mixed group of children, and furnishes no information upon a number of points upon which information would be desirable. The relations which seem to be clearly established can be stated briefly.

The material consisted of the definitions for twenty-seven more or less abstract words in common use written by boys and girls of from eight to fifteen years of age. These were gathered by the teachers under the guidance of the following circular of instructions.

"To the Teachers:

(1) Please ask the children in your room to write on paper the meaning of each of these words.

(2) Have each child write his or her *first* name and age at the top of each sheet of paper used.

(3) Write the words on the blackboard, but only so many each day as may surely be defined during that period.

(4) Pronounce a word as often as a child wishes, and in the lower grades each word should be spoken as well as written.

(5) It is of the greatest importance that you should *not* give them any information that would suggest a definition, as this would make their definitions useless. Do not tell them not to use in their definitions the word that they are defining. It is the *child's* definition that is wanted.

(6) After the children have written the meaning of all the words, please tie their papers in a bundle, write the grade on the outside and hand the package to your principal.

Words to be defined :

- |               |                  |
|---------------|------------------|
| 1. hunger     | 15. thankfulness |
| 2. weight     | 16. truth        |
| 3. slowness   | 17. life         |
| 4. shape      | 18. hardness     |
| 5. color      | 19. health       |
| 6. laziness   | 20. anger        |
| 7. courage    | 21. neatness     |
| 8. strength   | 22. pleasure     |
| 9. goodness   | 23. man          |
| 10. love      | 24. play         |
| 11. length    | 25. house        |
| 12. happiness | 26. boy          |
| 13. size      | 27. home         |
| 14. use       |                  |

The total number of children who answered was 472, of whom 253 were girls and 219 boys. The number of papers for each age and sex was as follows: Girls, 8-year-olds 9, 9-year-olds 44, 10-year-olds 52, 11-year-olds 51, 12-year-olds 47, 13-year-olds 28, 14-year-olds 13, 15-year-olds 9. Boys, 8-year-olds 11, 9-year-olds 39, 10-year-olds 46, 11-year-olds 35, 12-year-olds 40, 13-year-olds 27, 14-year-olds 17, 15-year-olds 4. The total number of definitions considered was about 12,000, some of the children having failed to define some of the words.

All of the definitions which were legible were used in the classification. The basis of classification was for most of the words chiefly the way in which the thought was expressed (*i. e.*, the grammatical or rhetorical form of the definition), but as a rule form and content

ran parallel and content was so far regarded in all as to lead to the placing in a class by themselves of all those definitions that seemed to the classifiers as reasonably adequate. In the case of four words, however, *man*, *boy*, *house*, and *home*, the definitions were grouped according to content chiefly, but even here content and form ran closely enough together to allow these words to be taken into account in the general comparison. In the few cases where more than one definition was given for a single word the first one only was counted.

The classification of the definitions proved to be anything but an easy task; but was, nevertheless, carried through with care. To insure as great exactness as possible the writer first worked over the entire material alone and then a second time in conjunction with Dr. Sanford. The classes finally made when form of expression was the chief criterion are given below. Those made for the words classified according to content will be considered by themselves later.

(1) Definitions by use in a phrase or sentence, as: "Size, My size is very much."

(2) Definitions consisting of the word to be defined followed by "of something," "of anything," as: "Weight is the weight of something." It is difficult to tell whether these really belong to the preceding group or to an independent and early stage of real abstraction.

(3) Definitions involving the mention of a person or thing, as: "Pleasure, somebody that has fun;" "Thankfulness, somebody that is thankful."

(4) Definitions by examples, as: "Color means like red or blue."

(5) Definitions by the use of an adjective, as: "Anger means mad."

(6) Definitions by means of clauses introduced by *when*, *that* or *if*, and having somewhat the nature of examples; as: "Weight means when you are heavy;" "Size means when you are big; when you are fat and chunky;" "Neatness when you are clean." These will be referred to as the when-that-and-if clauses.

(7) Definitions by infinitives, as: "Hunger, to be hungry;" "Thankfulness, to thank somebody."

(8) Definitions by means of synonyms, as: "Happiness means joy;" "Life means existence."

(9) Definitions which, allowing for the child's informal use of language, seemed to the classifiers as on the whole adequate—definitions where the knowledge of the meaning is certain and the thought fairly well expressed. This class will be referred to as that of "Fair definitions." Examples: "Laziness is a habit when you are not ambitious;" "Pleasure the act of enjoying;" "Boy, a young man."

(10) Definitions which resisted classification either because unintelligible or because they could not be brought into any one of the other groups. This class will be known as the "Miscellaneous group." Not all were necessarily poor as definitions; a few might almost have been put in the ninth class, but because of some special peculiarity seemed better classed here.

Besides these ten classes, found more or less frequently for nearly all the words, there were for many words small groups of definitions of forms found rarely or not at all in the case of other words. These will not be further considered.

Though the ten chief classes are moderately distinct as outlined above, there arose in the actual classification a good many cases of doubt and a few in which the decision was felt to be more or less arbitrary. For this reason no importance can be attached to the particular figures found for each class, though the broader relations may still be assumed to hold good, to these alone reference will be made in what follows.

All the words, except *life*, which is *sui generis*, themselves fall into groups within which the proportions of definitions of the various classes are about alike, and of which a single word may be taken as typical.<sup>1</sup> It will be noticed also that these groups, quite apart from the children's treatment of them, belong in a measure to different sorts of abstractions. The type words and their groups are as follows:

PLEASURE: play, use, truth, love.

WEIGHT: size, length, strength.

HEALTH: hunger.

ANGER: courage.

HAPPINESS: neatness, hardness.

THANKFULNESS: laziness, goodness, slowness.

COLOR: shape.

BOY: man.

HOUSE: home.

LIFE.

The definitions, excluding the miscellaneous ones, may themselves be arranged in three, more general groups, which for convenience may be spoken of as (A) Definitions by Sample; (B) Definitions by Abstract phrases, and (C) Definitions by equivalents (including under that head the synonyms and "fair definitions").

#### A. Definitions by Sample.

These include the first five of the classes mentioned on page 255, in all of which the child's effort is to convey the thought indirectly by putting the hearer into a position in which he can grasp it for himself.

1. Definitions by Use of the Word in a Phrase or Clause. In these, so far as the child really tries to give the meaning of the word, he tries to do so by showing how it may be used, and in that way to suggest its meaning. In this procedure he is also very likely copying his seniors; for it is often easier to explain a word to a child by showing him how to use it than in any other way, and often satisfies him quite as well as would a genuine explanation. In the early school years also, much of the child's attention is given to getting command of the mother tongue, which would also incline him towards this sort of definition. Finally, it may be possible that for many of the youngest children the test words were taken in chiefly as auditory impressions and suggested their speech associates without much real conception of their meaning. In any case it is not surprising to find this sort of defining strong with the 8-9-year-olds, and falling rapidly away for the others.

2. Definitions Consisting of the Word to be Defined followed by "of something" or "of anything."

3. Definitions Involving the mention of a Person or Thing.

[It is difficult to tell whether the definitions of these two groups really belong with the illustrative phrases of Class 1, or stand for a stage in which the abstract quality can in a measure be focussed in attention, but cannot yet be wholly separated from the concrete context,—a sort of practical *universalia in re*. In any case the definition operates by reference to a relatively concrete instance. The numbers

<sup>1</sup> With regard to the differences within these groups the following may be worth mentioning: *Truth* has no examples and no fair definitions." *Play* and *love* have no adjective definitions and few synonyms. *Use* and *courage* are in general poorly defined. All the words ending in "ness" are treated by the children in much the same way, but *thankfulness* and the words grouped with it are defined somewhat more frequently in a way to bring out their active aspect. Other variations of the typical words among themselves, as far as they seem of interest, will be noticed later.

in both cases are too small to allow any certain inference as to the correlation with age].

4. Definitions by Examples. This is the typical case of primitive definition uninfluenced by the linguistic tendency of the first three classes.<sup>1</sup> Where the numbers are of some size, as in the case of the boys, there is a marked decline in this sort of definition as age increases.

5. Definitions by the Use of Adjectives. As evidence of power of abstract thought definitions of this sort stand upon about the same level as those of the second, third, and fourth classes. The correct use of an adjective involves a recognition of the existence of the quality indicated though not separated from the substance in which it inheres. Definition by the use of adjectives may thus be a verbal means of pointing out the essential quality in the thing defined. The precise words used will vary of course with the child's power of expression and his desire to avoid using words of the same root as those defined. He may say, "Laziness means lazy," or "Laziness means tired," according to his vocabulary and his notion of what is required in defining, without essentially differing in his mastery of the abstract idea. Definitions of this class like those by use of the word in a phrase or sentence belong on the whole to the younger children and decline noticeably with increasing age.

#### B. *Definitions by Abstract Phrases*

6. Definitions by When-that-and-if Clauses. This class marks, perhaps, a certain advance upon that of the adjectives, but like the latter shows a characteristic decline with increasing age. The typical forms, such as "Happiness, when you are happy," "Laziness, means that you don't want to come out of the bed," "Love means if you love that girl," all define by citing instances; but citation by a somewhat indefinite phrase indicates, perhaps, a little loosening of the abstract quality from its matrix in the concrete.

7. Definition by the Use of the Infinitive. With the definitions by means of infinitives we seem to pass from the lowest grade of definitions to a middle grade, though even here not a few of the definitions really cite examples. The infinitive is the most abstract form of the verb (except the participle) and usually in the definitions studied carries neither subject nor object. The following may serve as instances in which the infinitive seems to stand for a middle degree of abstraction: "Heaviness, to be heavy;" "Thankfulness, to be thankful;" "Truth, to be true." In the following it seems rather more like an example: "Hardness, to work hard;" "Play, to play games; to play dolls." Taking both sorts of infinitives together the figures show a rise in frequency up to twelve years with a slight (though perhaps accidental) fall for the 13-14-15-year-olds.

#### C. *Definitions by Equivalents*

8. Synonyms. Definitions by synonyms may seem to testify rather to an increased vocabulary than to an increased ability to handle abstractions, and doubtless it does so, but the choice of synonyms as a means of definition indicates at least a neglect of the more primitive forms and thus a certain advance. The increase of this form with age is noticeable in the case of both boys and girls.

9. Fair Definitions. These are infrequent with any of the children and nearly or quite lacking in those under ten or eleven years of age. Summing all this up in a single word we may say that such a mas-

<sup>1</sup>Lloyd Morgan: Introduction to Comparative Psychology, 2 ed., p. 229.

tery of common abstract ideas and of language as would make possible reasonably perfect definitions is nearly or quite wanting in children of thirteen and under, though for several years before that time the abstractions have been clearly enough grasped and the vocabulary has been large enough to allow a good deal of definition by synonyms. Still earlier the children seem to hold the idea in a distinctly concrete fashion and to convey it, when required to do so, by means of concrete examples variously expressed, while the youngest children of all in many cases cite examples of the use instead of really giving the meaning of the word, possibly for the reason that at that stage the idea itself cannot be brought clearly before consciousness.

Definitions by Negatives. Definition by negative forms includes such as the following: "Truth means no lie," "Happiness is not sad," "Laziness, somebody that does not want to work." The negatives for each word were compared with the number for every other word with the following general results: *Hunger*, from the very nature of the term had so many negatives (negation being implied even where it was not expressed) that it was classed by itself. Excluding *hunger*, *truth* has more than one-fifth of the total number of negatives for all the words. The form they take is "not to lie," "not false," "no lie." *Laziness* comes next with a little less than one-fifth. Here the negatives are used in such expressions as, "not to work," "don't want to do anything," and the like. Next comes *health* with expressions like, "not sick," and *slowness*, with such as "not fast," "not to go fast." There are none for *weight*, *length*, *size*, *use*, *house*, and only two or three each for the remaining words. There is a general increase of definitions by opposites or by the use of the negative from the younger to the older children. For *love* and *color* where there are only a few negatives to compare there is an exception, but not a marked one, to this statement.

As regards differences between the boys and the girls in ability to define, it seems certain that the girls succeed better than the boys at almost all points, getting rid earlier of the more primitive methods of indicating the idea and taking up earlier the more advanced.

#### *Words Classed according to Content*

The words *man*, *boy*, *house*, and *home* were classified according to content and not especially by form, as has already been said, though a number of the forms common in the other group occurred here also. The definitions for *man* have nothing corresponding to "a child" which constitutes a large class for the word *boy*, but the main classes are the same and are as follows, the classes being mentioned in the order of their size.

(1) *Fair Definitions*. These include logically correct definitions. Sometimes they are not expressed definitely, but where the idea is clearly correct the definitions were given the benefit of the doubt. Examples are: "Boy,—male child;" "before man;" "the first stage of man;" "a half sized man."

(2) "*A human being*" or "a person."

(3) *Definitions based on size*, as "man, a grown up human body;" "a male being about full length." This group decreases with increasing age.

(4) *Definitions making reference to sex*. It is interesting to note the sudden increase of definitions of this sort at about thirteen years, especially with the girls, notwithstanding the fact that the fair definition group increases too. The usual form of this definition is, "a male person," or "a male." A definition given by a twelve-year-old girl

emphasizes this sex distinction as follows: "A child that is not a girl and is born from birth as a boy."

There are also smaller classes of definitions common to both words, for example, definitions according to the clothes worn, examples and sentences. All of these appear for the most part with the younger children.

The definitions of *house* and *home* are largely interchangeable. For both words the largest class is, "where you live," "where people live," and it increases with the age of the children.

A few of the other words also show interesting peculiarities when the content of their definitions is studied. Out of all the verbal expressions for *love* including when-that-and-if clauses and infinitives, nine-tenths are active in form as, "when you love somebody," "to love somebody," and kindred expressions, while only about one-tenth are passive as, "when somebody likes you," "to be loved," etc. This is certainly a remarkable showing, but is, perhaps, not an inexact picture of the relative subjective importance of the experience in the case of the normal human being. Four girls and four boys define it as "when you like each other." Definitions of *love* as specifically between the sexes were relatively infrequent, as might be expected from children of these ages.

For about three-fourths of all the children *truth* is simply "telling the truth," or "not to lie;" for one-third it is "the opposite of falsehood" or "untruthfulness." It will be remembered that the negatives for truth far outnumbered those of most other words, and these belonged to the "not to lie" or "no lie" class.

*Laziness*, like *love*, is defined from both the active and passive sides, as "to sit or lie around," and "a tired disagreeable feeling." The latter is by no means infrequent.

Most definitions of *life* turn on such expressions as "to be alive" or "to be living," but there are a few more definite expressions as: "when your heart is beating," "when there is breath in the body," "when you have got feeling."

With a view of comparing the definitions of the children with those of a group of adults, seventeen of the words used with the children were given also to the members of one of the psychological classes in Clark University, fourteen in all. In the case of a part of the words they were asked to note introspectively anything of importance to be observed in the framing of the required definitions.

The chief thing shown by these introspections is the great mass of associations which a word calls up. The definitions show a greater command of language and the influence of reading and of book definitions, but on the whole, were not strikingly different from those of the children. Four-fifths of the students stated that the word called up a concrete image.

The children's definitions were also compared with those of the dictionaries. The children and the dictionary makers differ in that the latter give fuller and more exhaustive definitions. Dictionary makers view a word from every aspect, while the child considers only one. This distinction may be due to the child's meagre associations, to his lack of facility in handling language and to his lack of time. Yet for the aspect which the child does define he often expresses the meaning nearly as well as, and sometimes better than, the dictionaries, though his mode of expression is often questionable from the standpoint of rhetoric and grammar.

For nouns derived from the adjective, as *happiness*, *thankfulness*, and all nouns ending in "ness," the dictionary definitions are usually such as "the state of being happy, in any sense of that word," "the



state of being thankful," etc. These are words for which adjective and infinitive definitions abound with the children. The superiority of the dictionary makers, it will be noticed, is due to little more than a greater grasp of language.

The students' definitions stand half-way between those of the children and those of the dictionaries, their definitions are longer and more fully expressed, but do not exhaust the word. Philosophical, psychological and biological definitions are the most numerous sort. Many admit that the word called up definitions they had read when studying these subjects.